

Data Used in the Clean Water Action Plan Unified Watershed Assessment

Name of Data Layer: **Estuarine Fish Index of Biotic Integrity**

Definition (General Description): Data are collected monthly (July - September). Multiple sites are sampled on each river system. Abundance by species is calculated. These data are summed for the entire season and reduced to metrics: total number of species, number of species comprising 90% of the catch, number of species in the bottom trawl, anadromous fish abundance, estuarine fish abundance, total fish abundance less menhaden, proportion of planktivores, proportion of carnivores, proportion of benthivores

Data Source: Maryland Department of Natural Resources Resource Assessment Service, Index of Biotic Integrity sampling program

Data Type: Condition X Stressor ____ Vulnerability ____ Trend ____ Growth ____
Other _____

Method of Calculation: These data are transformed to achieve normality. Data are ranked into terciles and assign a score of 1 if in the lower third of the distribution, 3 in the middle third, and 5 in the upper third. These ranks are summed to yield the IBI score.

A distribution of the IBI scores was examined. Scores representing the 75th, 50th, and 25th percentiles of the distribution were output. Sites were distributed based on these rankings into groups, where group 3 represented any scores in the upper 25th percentile of the distribution, group 2 scores falling between the 25th and 75th percentiles, and group 1 if scores fell in the lower 25th percentile of the distribution. Tests of significance showed that the groupings were significantly different ($p=.0001$), and that the groupings were significant from one another. For the INRA/UWA project, a ranking of 2 infers severe disturbance in the fish community, a 5 moderate, and an 8 minimal.

For the UWA, watersheds are placed in Category I (needs restoration) if they are in the lower 25% of scores for the applicable watersheds for the Estuarine Fish IBI. Watersheds are placed in Category II (needs preventative action) if they have scores in the middle 26-74 % of scores for the applicable watersheds. Watersheds are placed in Category III (pristine watersheds) if they have scores in the highest 25% of scores for the applicable watersheds.

Watershed Scale: Tributary Strategy Region¹ ____ USGS 8 Digit ____ MD 6 Digit ____
MD 8 Digit X MD 12 Digit ____ Adaptable to Any Scale ____ Other _____

Data Custodian: Tidewater Ecosystem Assessments/RAS/DNR

¹The Youghiogeny watershed and the Coastal Bays region are considered to be Tributary Strategy Regions for the purposes of this program

Clean Water Goal: Yes ____ No X

If Yes: Description of Goal _____

Other Natural Resource Goal: Yes ____ No X

If Yes: Benchmark Goal ____ Relative Goal ____

If Benchmark Goal - Description of Benchmark _____

Assumptions _____

Comments: We feel a little uncomfortable in taking site specific data and rolling it into a gross measure for a watershed. We have seen that the upstream areas (areas closer to the upper part of the watershed - near to the source?) show more disturbance based on the fish community than areas nearer to the mouth of the watershed where main bay effects may buffer the disturbance that is causing fish community disruptions.

This was a quick and dirty exercise that could be developed into a more robust measure that assesses individual measures of the fish community. For example, we may be able to develop measures more specific to recreationally and commercially important species. We could integrate more of the fisheries data (landings, stock assessments) and develop trends using these data. We could also examine trends in community measures and developing a ranking scheme on these. These measures would certainly give a more robust assessment of the condition of the entire fish community in relation to the watershed.

References: see "Methods used for Tidal Water Quality, SAV, Benthic IBI and Fish IBI data consolidation for the INRA/UWA project" for more information.